

## EASY ASSEMBLED TUBE CONNECTOR

### FIELD OF THE INVENTION

5 The present invention relates to tube joints, and particularly to a easy assembled tube connector, wherein a buckling ring is embedded into a tube body and a connecting seat of a tube joint is engaged into the buckling ring. The tube joint with the connecting seat is made as a multi-directional joint so as to connect a plurality of tube bodies.

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### 10 BACKGROUND OF THE INVENTION

In the prior art, tubes, such as lamp tubes, display tubes, electric tubes, wire tubes, need tube joints for connecting different tubes so as to from pipelines. Thereby, electric wires, power wires, or gas tubes can pass through the tubes.

15 Currently, most of the tube joints are formed with outer threads and the tubes are threaded in the inner surface. The nuts used in the tube joints are hexagonal shapes. Thereby, the outer thread of the tube joint can be connected to the inner thread of the tube body.

20 However, the above mentioned prior art is not beneficial to be loaded with electric wires, cables, signal wires, or gas tubes. This is because in the screwing process, the wires or tubes in the tube body will rotate. Thus this will induce some problems in assembly.

### SUMMARY OF THE INVENTION

25 Accordingly, the primary object of the present invention is to provide an easy assembled tube connector, wherein the lines or wires in a tube can be arranged in order.

To achieve above object, the present invention provides an easy assembled tube connector, wherein a buckling ring is embedded into a tube body and a connecting seat of a tube joint is engaged into the buckling ring. Then it is rotated through a predetermined angle so as to complete the assembly work. The tube joint with the connecting seat is made as a multi-directional joint so as to connect a plurality of tube bodies. Thus, the tube joint can be used to different lamp tubes, display tubes, electric tubes, wire tubes, etc., especially for the tubes with wires therein or high pressure tubes.

10 The various objects and advantages of the present invention will be more readily understood from the following detailed description when read in conjunction with the appended drawing.

#### **BRIEF DESCRIPTION OF THE DRAWINGS**

15 Fig. 1 is an exploded perspective view of the present invention.

Fig. 2 is a cross sectional view showing that

Fig. 2(A) is a cross sectional view along the line A-A of Fig. 2.

Fig. 2(B) is a cross sectional view along line B-B of Fig. 2.

Fig. 2(C) is a cross sectional view along line C-C of Fig. 2.

20 Fig. 3 is a cross sectional view showing that the connecting seat is embedded into the buckling ring according to the present invention.

Fig. 3(D) is a cross sectional view along line D-D of Fig. 3.

Fig. 3(E) is a cross sectional view along line E-E of Fig. 3.

Fig. 3(F) is a cross sectional view along line F-F of Fig. 3(D).

25 Fig. 4 is a cross sectional view showing that the tube body is rotated to a buckling angle according to the present invention.

Fig. 5(G) is a cross sectional view showing Fig. 4 of the present invention.

Fig. 6(H) is a cross sectional view of the line H-H of Fig. 5.

Fig. 7 is an exploded perspective view showing the applications of the present invention.

## 5 DETAILED DESCRIPTION OF THE INVENTION

In order that those skilled in the art can further understand the present invention, a description will be described in the following in details. However, these descriptions and the appended drawings are only used to cause those skilled in the art to understand the objects, features,  
10 and characteristics of the present invention, but not to be used to confine the scope and spirit of the present invention defined in the appended claims.

Referring to Fig. 1, the easily assembled tubular connector of the present invention is illustrated. The easily assembled tubular  
15 connector includes a plurality of buckling rings 1 and a tube joint 2.

Each buckling ring 1 has a polygonal shape. In the embodiment of the present invention shown in Figs. 1 to 7, the buckling rings 1 have eight end surfaces 10, 11. The end surfaces 10 and end surfaces 11 are alternatively arranged. Each end surface 10 is formed with at least one  
20 outward extended elastic claw 12. The end surfaces having the claws 12 are not adjacent to one another. Each end surface 11 is formed with at least one elastic hook 13. Each hook 13 has an “ㄟ” (which is pronounced as “ai”, a Chinese word) shape. Two opposite end surfaces 11 in the buckling ring 1 is formed with inwards inclined stop 15.

25 The buckling ring 1 must be embedded into the wall 31 of the tube body 3 (referring to Fig. 2). The plurality of elastic claws 12 on the buckling ring 1 can be compressed to be embedded into a tube for positioning. The claws 12 positioning within a tube will buckle the

wall 31 by the lower outward elastic sheet (referring to Fig. 2A).  
Thereby, the buckling ring 1 will not fall out from the tube body 3.  
Moreover, other than the plurality of elastic claws 12, the part of the  
buckling ring 1 buckled to the wall 31 includes the end walls 14 of the  
5 buckling ring 1 (referring to Fig. 2B). Thus, the buckling ring 1 can  
be steadily buckled within the wall 31 of the tube body 3. Further, the  
“∧” shape hooks 13 on the buckling ring 1 will be inward reduced to be  
stand in the tube body 3 (referring to Fig. 2(C)).

In Figs. 1 to 6 of the present invention, the tube joint 2 has a tube  
10 joint 2 which can be buckled at two ends. .

The tube joint 2 has an approximate round shape connecting seat 20.  
Each connecting seat 20 has a through hole 21. The connecting seat 20  
has a shape corresponding that of the buckling ring 1. Thereby, in this  
embodiment, the connecting seat 20 has an octagonal shape, and has  
15 corresponding grooves 22 and stoppers 23 (referring to Fig. 1). The  
stoppers 23 and the grooves 22 are alternatively arranged so as to form  
an octagon. Each stopper 23 is at the edge of the through hole 21.  
One side of each stopper 23 far away from the edge of the through hole  
21 is connected to a first stepped surface 24 and a second stepped  
20 surface 25. The tops of the first stepped surface 24 and second stepped  
surface 25 are installed with a first inclined surface 241 and the second  
inclined surface 251 which are connected to the stopper 23. A top of  
each stopper 23 is formed with a recess 26.

Each connecting seat 20 of the tube joint 2 can be embedded into the  
25 buckling ring 1 firstly (referring to Fig. 3). In embedding process,  
each groove 22 of the connecting seat 20 is coupled with a respective  
hook 13. The inclined stop 15 at one the end surface 11 of the buckling  
ring 1 can be temporarily coupled to the groove 22 (referring to Figs.

3(D) and 3(F)). Meanwhile, the claws 12 are expanded to be embedded into the wall 31 of the tube body 3. Thus, each end surface 10 has a sufficient space for embedding a respective stopper 23 (referring to Figs. 3(E) and 3(F)).

5        When the connecting seat 20 is embedded into the buckling ring 1 (referring to Fig. 3(F)), the tube body 3 and the buckled buckling ring 1 must be rotated or one of the connecting seat 20 and the tube joint 2 are rotated to a buckling angle  $\theta$  (referring to Fig. 4) so that the hook 13 in the groove 22 can pass through the first stepped surface 24 to be  
10        elastically embedded into the second stepped surface 25. Thereby, the tube body 3 is engaged to the wall 31 (referring to Fig. 5(G)). Then the inclined stop 15 in the end surface 11 of the buckling ring 1 will buckle the recess 26 of the stopper 23 of the connecting seat 20 (referring to Fig. 6(H)). Thus, the tube joint 2 can be rapidly and  
15        firmly secured to the tube body 3.

      When it is desired to detach the tube joint 2 from the tube body 3, it is only necessary to reversely rotate the tube joint 2 or the tube body 3 to above buckling angle  $\theta$ . Then the tube body 3 can be draw out from the connecting seat 20. Thus the detaching work can be performed  
20        rapidly and easily.

      In above embodiment, the end surfaces 10, 11 of the buckling ring 1, the grooves 22 and the stoppers 23 of the connecting seat 20 of the tube joint 2 have octagonal shapes. Each plane of the octagon is 45 degrees. Thus the buckle angle  $\theta$  can not be over 45 degrees. Thus, the  
25        assembly work can be performed easily and conveniently. Otherwise the present invention can improve the connecting effect and the buckling ring 1 and connecting seat 20 can be connected firmly. In the present invention, the buckling ring 1 and the connecting seat 20 can be

any polygonal shape. All these are within the scope of the present invention.

Furthermore, in the present invention, the tube joint 2 with the connecting seat 20 is made as a multi-directional joint, such as the L shape two directional tube joint 27, the T shape three directional tube joint 4, the L shape three directional tube joint 40, the cruciform four directional tube joint 4, the curved cruciform tube joint 50, the six directional tube joint 5, etc. so as to connect a plurality of tube bodies. Thus, the tube joint can be used to different lamp tubes, display tubes, electric tubes, wire tubes, etc., especially for the tubes with wires therein or high pressure tubes.

Although the present invention has been described with reference to the preferred embodiments, it will be understood that the invention is not limited to the details described thereof. Various substitutions and modifications have been suggested in the foregoing description, and others will occur to those of ordinary skill in the art. Therefore, all such substitutions and modifications are intended to be embraced within the scope of the invention as defined in the appended claims.